

IN THE DRAWINGS

Applicants propose to correct the spelling of the term "Column" in Fig. 1 in accordance with the accompanying ANNOTATED SHEET SHOWING CHANGES.

Enclosed herewith is a REPLACEMENT SHEET in which the above change has been incorporated.

REMARKS

Enclosed herewith is a Substitute Specification in which the specification as filed has been amended in various places to correct typographical and grammatical errors.

In support of the above, enclosed herewith is a copy of the specification as filed marked up with the above changes.

The undersigned attorney asserts that no new matter has been incorporated into the Substitute Specification.

The claims have been amended to more clearly define the invention as disclosed in the written description. In particular, claims 31-40 have been indicated as "Withdrawn" to comport with Applicants' restriction to claims 1-30. In addition, claims 1-25 have been cancelled, while the claims have been amended for clarity.

Applicants believe that the above changes answer the Examiner's objection to the claims, and the Examiner's 35 U.S.C. 112, paragraph 2, rejection of the claims, and respectfully request withdrawal thereof.

The Examiner has objected to Applicants' oath/declaration as missing signatures, and has not accorded Applicants' claim for foreign priority.

Applicants believe that the Examiner is mistaken. In particular, in response to the NOTIFICATION OF MISSING REQUIREMENTS UNDER 35 U.S.C. 371 IN THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) mailed September 28, 2006, Applicants filed a Declaration signed by all three inventors. Enclosed herewith is a

copy of the Electronic Acknowledgement Receipt evidencing receipt of the Declaration on October 30, 2006.

Applicants therefore request that the Examiner acknowledge receipt of the fully executed Declaration, and acknowledge Applicants' claim for foreign priority.

Enclosed herewith is a copy of "DVD Read-Only Disk File System Specifications" a copy of which the Examiner noted as being missing from Applicants' Information Disclosure Statement dated May 24, 2006.

The Examiner has rejected claims 1-3, 10, 16-18 and 25 under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,408,301 to Patton et al. The Examiner has further rejected claims 4, 5, 19 and 20 under 35 U.S.C. 103(a) as being unpatentable over Patton et al. in view of U.S. Patent Appln. Publication No. US2001/0042107 to Palm. Applicants believe that the above changes render these rejections moot.

The Examiner has rejected claims 6-9, 11-14, 21-24 and 26-29 under 35 U.S.C. 103(a) as being unpatentable over Patton et al. in view of U.S. Patent 6,584,459 to Chang et al. The Examiner has further rejected claims 15 and 30 under 35 U.S.C. 103(a) as being unpatentable over Patton et al. in view of Chang et al., and further in view of Palm.

The Patton et al. patent discloses an interactive image storage, indexing and retrieval system, in which a plurality of images are storable in digital form on a writeable CD, each with an

associated information file including metadata which has been automatically captured and stored and/or input by a user.

The Chang et al. patent discloses a database extender for storing, querying, and retrieving structured documents, in which XML documents and definition elements are described, and in which an index file is written in a meta-language.

First, Applicants would like to point out that while Patton et al. discloses what may be considered content object files, all of these files contain a single data type, i.e., image data. There is no disclosure nor suggestion in Patton et al. that the object files may respectively contain different data types. Since there is no disclosure otherwise, one must presume that the optical storage medium of Patton et al. is prepared in the usual manner, i.e., a content recognition file describing the data type is located in the physical layer of the disc, e.g., the lead-in area of the disc, and not in the application layer.

The Examiner further indicates that Patton et al. discloses "an object definition files associated with the object and describing the object (each image stored with an associated information file, the associated information file including metadata which has been automatically captured and stored and/or input by a user [Column 2, lines 13-38])".

Applicants submit that the Examiner is mistaken. In particular, the object definition file, as claimed, describes "the data type in said at least one content object file". The metadata in the information file of Patton et al. does not describe the data

type in the content object file. Rather, as described in Patton et al. at col. 4, lines 28-39, the metadata includes "index pointers to images, time, date, GPS location (associated place), attitude, altitude, direction, exposure settings (aperture/shutter speed), illuminate (daylight/tungsten/florescent/IR/flash), lens setting (distance/zoom position/macro), sound volume/frequency, scene data (blue sky/water/grass/faces), and subject motion. The user also has the option of manually designating metadata to be added such as, scene length, event length, time frame (within the hour, today, this week), record mode (motion/still/burst), and user a designations (text, image, or verbal designation)". None of these metadata describe the data type, since Patton et al. only envisages storing image data.

The Examiner further indicates that the optical storage medium of Patton et al. further includes an index file, and references col. 2, lines 13-38.

Applicants submit, however, that the Examiner is mistaken. In particular, the "index" referred to in col. 2 of Patton et al. is, in fact, stored in a memory separate from the optical storage medium. This is described in Patton et al. at col. 3, lines 61-62, "The secondary storage or picture index memory is best done with Flash RAM."

The Palm publication discloses a networked audio player transport protocol and architecture, in which a multimedia device "is also able to parse a play list, containing URLs of specific clips, in XML format." However, Applicants submit that Palm does

not supply that which is missing from Patton et al. and Chang et al.

In view of the above, Applicants believe that the subject invention, as claimed, is not rendered obvious by the prior art, either individually or collectively, and as such, is patentable thereover.

Applicants believes that this application, containing claims 26-30 (claims 31-40 having been withdrawn), is now in condition for allowance and such action is respectfully requested.

Respectfully submitted,

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MARKED-UP SPECIFICATION

TITLE: OPTICAL DISC WITH A GENERIC LOGICAL FORMAT

INVENTOR(S): WANG BEI ET AL.

SERIAL NO.: 10/580,515

ATTY. DOCKET NO.: PHCN 020023

OPTICAL DISC WITH A GENERIC LOGICAL FORMAT

BACKGROUND OF THE INVENTION

Field Of The Invention

I00011 The invention relates generally to optical discs, and more particularly to an optical disc with a generic logical format that is independent of the content type and the physical medium.

Description Of The Related Art

I00021 Optical storage media, such as optical discs, have been widely used to store different types of media, such as audio, video, data and images. In the development of the optical disc technology, numerous physical and logical disc formats have emerged and have been commercialized. For example, the physical media have gone through a path from CD to DVD, then to Blu-ray disc and in the future, to other new optical storage media. As to the logic formats of the disc, there are CD-Audio, Picture CD, VCD, SVCD, DVD, etc. The media content types include MPEG1, MPEG2, AC-3, MP3, etc. for the audio formats, and MPEG1, MPEG2, MPEG4, DIVX, etc. for the video formats. Each of these formats is described in lengthy detailed specifications. Player manufacturers have to provide support for each of these formats or suffer from a decline in their market shares. Therefore, any introduction of a new format (physical or logical) is a resource consuming and risky process, which requires close cooperation among the various parties

involved, e.g., the content providers, player manufacturers, etc. Further, consumers are forced to buy a new generation of player for each new format introduced, which may not support competing formats. Additionally, the new format may not be supported by all the content providers. As a consequence, it creates a lot of confusions among consumers and significantly increases the thresholds for adopting new formats.

I00031 Therefore, there is a need for an optical disc with a generic logical format that is independent of the content type and the physical medium.

SUMMARY OF THE INVENTION

I00041 The present invention provides an optical disc with a generic logical format having a data structure that is defined independent of the content type (i.e., the data type and medium encoding scheme) and the physical medium.

I00051 In accordance with one embodiment of the invention, a data storage medium is provided for storing data for access by a data processing system. The data storage medium comprises a data structure stored in the medium for describing different data contents stored therein. The data structure includes at least one content object containing data contents, an object definition file associated with the object for describing the object, and an index file including a table of contents having a reference to the object.

[0006] The generic logical format of the invention can be easily adapted to any new content types without the need to define a complete new format. Further, different types of contents can be stored on the same disc and these contents can be either related or unrelated. Moreover, since the generic logical disc format is independent of the physical media, it can be implemented in any existing or future optical disc media such as DVD, Blu-ray disc, etc.

[0007] Other objects and attainments together with a fuller understanding of the invention will become apparent and appreciated by referring to the following description and claims taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The invention is explained in further detail, and by way of example, with reference to the accompanying drawings wherein:

[0009] FIG. 1 illustrates a generic logical format in an application layer of an optical disc according to one embodiment of the invention; and

[0010] FIG. 2 is a flow chart diagram illustrating the operation of a player on an optical disc having a generic logical format according to one embodiment of the invention.

[0011] Throughout the drawings, the same reference numerals indicate similar or corresponding features or functions.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[00121] In accordance with the present invention, an optical disc is defined with a generic logic format having a data structure in which the data contents stored on the disc are not limited to a particular data type, such as video, audio or data, and the applications or the encoding schemes (e.g., MPEG2, MPEG4, DIVX, etc.) relating to these contents do not have to depend on the physical format of the optical media. This is achieved by making the application layer of the disc independent of the physical layer of the disc. Moreover, the content recognition file usually located in the lead-in area of the disc is moved from the physical layer to the application layer. In this way, different data types of the contents and different applications relating to these contents can co-exist on the same optical disc and interact with each other, independent of the physical format of the disc. Thus, for example, a CD-audio format can be implemented on a DVD disc, and vice versa. Further, existing encoding schemes (e.g., DVD-Video) can be easily implemented on any future optical disc media and other storage media with random access capability, e.g., a hard disk, a flash memory, etc.

[00131] FIG. 1 illustrates a generic logical format 10 in an application layer of an optical disc that is either a recordable disc or a published ROM disc, according to one embodiment of the invention. Generic logical format 10 includes a plurality of content object files 12 containing various data types in different

encoding schemes, a plurality of object definition files 13 associated with content object files 12, a presentation file 16 storing the presentation definitions about the objects to be played, and an index file 20 used as a startup file. Index file 20 includes a table of contents (TOC) 22 containing references to different types of files on the disc, e.g., video files 26, audio files 32, data files 36, etc., for linking to content object files 12.

[0014] In this embodiment, index file 20 is defined with a ~~meta~~-language, such as XML (extensible Markup Language). Furthermore, each of content object files 12 is defined with an associated object definition file 13 including the content title, the content type, the content description, etc. Each object definition file 13 is preferably written in a ~~meta~~-language, e.g., XML. Presentation file 16 includes a menu and a playlist and is written in a ~~meta~~-language, e.g., SMIL (Synchronized Multimedia Integrated Language), for controlling synchronization and timing. This SMIL file can obtain general XML information about content object files 12 from associated object definition files for presenting the content objects on a video screen. Of course, these files do not have to be written in XML or SMIL. Other ~~meta~~-languages, including custom-defined ~~meta~~-language, may also be used to serve the same purposes.

[0015] FIG. 2 is a flowchart ~~diagram~~ illustrating the operation of a player ~~on~~-of an optical disc having a generic logical format

according to one embodiment of the invention. Such a player typically includes a microprocessor. In reading the disc (step 102), the player will determine ~~determines~~ whether an appropriate parser (e.g., a XML parser) is available on the player (step 106). If an appropriate parser is not on the player, it will determine ~~the~~ the player whether ~~it~~ the appropriate parser is available from the disc (step 112) or on the Internet (step 116). If the parser cannot be obtained, the player will notify ~~notifies~~ the user that the disc is not recognizable (step 122) and reject ~~rejects~~ the disc. On the other hand, if the parser is obtainable from either the disc or the network, the player will get ~~gets~~ the parser (step 126). Once the parser is obtained, the player will parse ~~sparse~~ index file 20 with the parser (step 132) to obtain the TOC. The player will prompt ~~prompt~~ a user to select a content object file 12 from the original TOC on the disc (step 136), and parse ~~the~~ the player parses the associated object definition file (step 142) to determine whether the content type of the object is playable (step 146). If the object is not playable by the player, the player will prompt ~~prompt~~ the user to select another object, and parse ~~the~~ the player parses the associated object definition file in the same manner. However, if the object is playable, the player includes the object in a filtered TOC stored in the player (step 152) and determines whether this object is the last one on the disc. If it is not the last object on the disc, steps 136 through 156 will be ~~are~~ repeated. After all the objects have been parsed, the player

will present presents a filtered TOC with playable contents to the user on a video screen (step 162). The filtered TOC differs from the playlist in the presentation file in that it contains references to only those content objects playable on the particular player.

[00161] In this invention, the file system is not required, but may be optionally included in the disc. In such a case, the file system and the index file are independent of each other, and the player can address a content object by using either the file name from the file system or the track number from the index file.

[00171] While the invention has been described in conjunction with specific embodiments, it is evident that many alternatives, modifications and variations will be apparent to those skilled in the art in light of the foregoing description. Accordingly, it is intended to embrace all such alternatives, modifications and variations as fall within the spirit and scope of the appended claims.

Abstract-ABSTRACT OF THE DISCLOSURE

The present invention provides an optical disc with includes a generic logical format having a data structure that is defined independent of the content type (i.e., the data type and medium encoding scheme) and the physical medium. In accordance with one embodiment of the invention, a data storage medium is provided for storing data for access by a data processing system. The data storage medium ~~comprises~~ includes a data structure stored in the medium for describing different data contents stored therein. The data structure includes at least one content object containing data contents, an object definition file associated with the object for describing the object, and an index file including a table of contents having a reference to the object. The generic logical format of the invention can be easily adapted to any new content types without the need to define a complete new format.